

PATENT ABSTRACTS OF JAPAN

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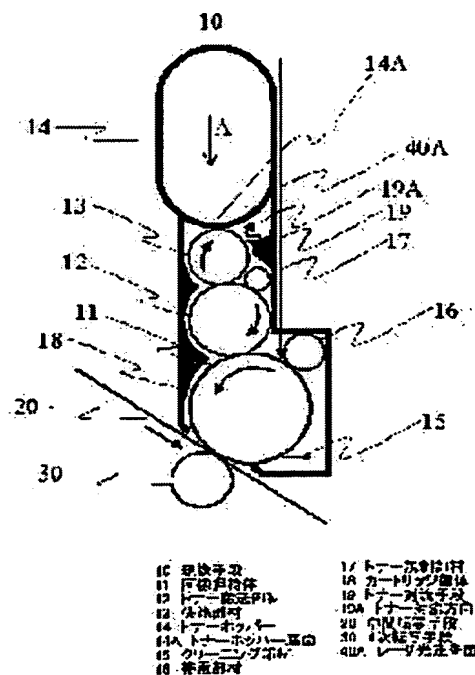
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(54) PROCESS CARTRIDGE AND IMAGE FORMING DEVICE

(57)Abstract:

PROBLEM TO BE SOLVED: To provide a process cartridge and an image forming device which can form a color image of high quality and which can be miniaturized by constituting the process cartridge (developing means) so that it has a prescribed arrangement.

SOLUTION: The device is provided with: a toner carrying member 12 for carrying/developing toner when a developing means 10 for developing an electrostatic latent image formed on an image carrier 11 rotates in a prescribed direction while coming into linear contact with the image carrier 11 with the image formed by an exposure means 40; and a supply member 13 for supplying the toner to the toner carrying member 12 in accordance with the rotation in a prescribed direction while coming into linear contact with the toner carrying member 12. The image carrier 11 of the developing means 10, the toner carrying member 12 and the supply member 13 are arranged in this order by regarding a surface nearly parallel to a laser beam scanning surface 40A as a reference.



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CLAIMS

[Claim(s)]

[Claim 1] It is the process cartridge with which the imprint side of a middle imprint means to imprint on an imprint object after carrying out imprint maintenance of the toner image formed in the image support which plurality rotates in piles is arranged by inclining with a base at an angle of predetermined. The toner conveyance member which carries out conveyance development of the toner by rotating in the predetermined direction after a development means to develop the electrostatic latent image on said image support has ****(ed) to said image support formed by the exposure means, By rotating in the predetermined direction in the condition of having ****(ed) with said toner conveyance member the feed zone material which supplies a toner to said toner conveyance member -- having -- a laser beam scan layer -- receiving -- abbreviation -- the process cartridge characterized by arranging said image support, said toner conveyance member, and said feed zone material of said development means in this sequence on the basis of an parallel field.

[Claim 2] The process cartridge according to claim 1 characterized by being constituted so that a toner hopper, said feed zone material, said toner conveyance member, and said image support may be arranged together with the abbreviation gravity direction and the outer diameter of said image support of said development means, the outer diameter of said toner conveyance member, and the outer diameter of said feed zone material may become small in order of said image support, said toner conveyance member, and said feed zone material.

[Claim 3] The process cartridge according to claim 1 or 2 characterized by having the toner convection-current means which approached in parallel with said feed zone material.

[Claim 4] The process cartridge according to claim 3 which supplies the toner stored in said toner hopper from a toner supply aperture to said feed zone material side, considers it as a configuration with which said toner supply aperture is plugged up in contact with said feed zone material where toner supply is made into the gravity direction, and is characterized by considering as the configuration to which a toner is newly supplied by rotating said feed zone material.

[Claim 5] It is image formation equipment with which the imprint side of the middle imprint object imprinted on an imprint object after carrying out imprint maintenance of the toner image formed in the photo conductor which plurality rotates in piles is arranged by inclining with a base at an angle of predetermined. The developing roller which carries out conveyance development of the toner when the process cartridge which develops the electrostatic latent image on said photo conductor rotates in the predetermined direction in the condition of having ****(ed) to said photo conductor formed by the exposure means, By rotating in the predetermined direction in the condition of having ****(ed) with said developing roller It is based on an parallel field. the supply roller which supplies a toner to said developing roller -- having -- a laser beam scan layer -- receiving -- abbreviation -- Image formation equipment with which said photo conductor, said developing roller, and said supply roller of said process cartridge are characterized by having two or more process cartridges currently arranged in this sequence.

[Claim 6] Said process cartridge is image formation equipment according to claim 5 characterized by being constituted so that the toner hopper, said supply roller, said developing roller, and said photo conductor may be arranged together with the abbreviation gravity direction and the outer diameter of said photo conductor of said process cartridge, the outer diameter of said developing roller, and the outer diameter of said supply roller may become small in order of said photo conductor, said

developing roller, and said supply roller.

[Claim 7] Said process cartridge is image formation equipment according to claim 5 or 6 characterized by having the toner convection-current means which approached in parallel with said supply roller.

[Claim 8] Said process cartridge is image-formation equipment according to claim 7 which supplies the toner stored in said toner hopper from a toner supply aperture to said supply roller side, considers it as a configuration with which said toner supply aperture is plugged up in contact with said supply roller where toner supply is made into the gravity direction, and is characterized by to consider as the configuration to which a toner is newly supplied by rotating said supply roller.

[Claim 9] Said two or more process cartridges and said exposure means which can emit two or more laser beams, Said middle imprint object which constitutes a color picture for the toner image which said process cartridge developed in piles one by one with primary imprint means, Image formation equipment according to claim 8 characterized by having secondary imprint means for imprinting said color picture in a form, a fixing means to carry out heat fixing of the toner on a form, and a means to convey a form.

[Claim 10] at the same time the imprint side of said middle imprint object arranges said middle imprint object so that it may touch in the condition of having inclined at an angle of the base of said photo conductor, and predetermined -- said laser beam scan layer -- receiving -- abbreviation -- the image formation equipment according to claim 9 characterized by arranging said photo conductor, said developing roller, and said supply roller on the basis of an parallel field.

[Claim 11] said laser beam scan layer by which said photo conductor, said developing roller, and said supply roller are obtained from said exposure means -- receiving -- abbreviation -- criteria [field / parallel] -- carrying out -- said supply roller [from said primary imprint means side] -> -- said developing-roller -> -- the image formation equipment according to claim 10 characterized by being arranged in the condition of having ****(ed) mutually together with the order of said photo conductor of said process cartridge.

[Claim 12] The toner stored in said exchangeable toner hopper The toner layer which the stratification is carried out on said developing roller, and is formed on said developing roller with said supply roller After a toner is electrified by toner specification-part material, it considers as the thin layer of uniform thickness. It is carried to the development nip which touches said photo conductor, and said photo conductor is electrified in the front face with an electrification roller. The toner image which the electrostatic latent image was formed by said exposure means, and the toner developed the electrostatic latent image concerned in development nip, and was formed on said photo conductor Image formation equipment according to claim 11 characterized by for said primary imprint means progressing and said middle imprint object imprinting from said photo conductor with the imprint bias potential impressed by said primary imprint means.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the process cartridge and image formation equipment which make a miniaturization possible while performing high-definition color picture formation by starting an image formation technique, especially considering the configuration of a process cartridge (development means) as predetermined arrangement.

[0002]

[Description of the Prior Art] Against the background of the spread of the latest explosive Internet etc., it became possible to collect various information on a seat comparatively simply through PC (personal computer). Consequently, if the printer (especially electrophotography color printer) which is performed also in a general office and performs an image output has information printing, it is in the situation that printed information takes for becoming complicated (advancement), and colorization is required.

[0003]

[Problem(s) to be Solved by the Invention] However, a high speed and the conventional electrophotography color printer which is silence comparatively are large as a business machine, and further miniaturization and low-pricing are desired. Moreover, with highly-minute-izing of an image, the toner was diameter[of a granule]-ized further and there was a trouble that uniform development control was difficult.

[0004] This invention is made in view of this trouble, and the place made into the purpose is in the point of offering the process cartridge and image formation equipment which make a miniaturization possible while performing high-definition color picture formation by considering the configuration of a process cartridge (development means) as predetermined arrangement.

[0005]

[Means for Solving the Problem] The summary of invention of this invention according to claim 1 is a process cartridge with which the imprint side of a middle imprint means to imprint on an imprint object after carrying out imprint maintenance of the toner image formed in the image support which plurality rotates in piles is arranged by inclining with a base at an angle of predetermined. The toner conveyance member which carries out conveyance development of the toner by rotating in the predetermined direction after a development means to develop the electrostatic latent image on said image support has ****(ed) to said image support formed by the exposure means, By rotating in the predetermined direction in the condition of having ****(ed) with said toner conveyance member the feed zone material which supplies a toner to said toner conveyance member -- having -- a laser beam scan layer -- receiving -- abbreviation -- it consists in the process cartridge characterized by arranging said image support, said toner conveyance member, and said feed zone material of said development means in this sequence on the basis of an parallel field. Moreover, the summary of invention of this invention according to claim 2 A toner hopper, said feed zone material, said toner conveyance member, and said image support are arranged together with the abbreviation gravity direction. And it consists in the process cartridge according to claim 1 characterized by being constituted so that the outer diameter of said image support of said development means, the outer diameter of said toner conveyance member, and the outer diameter of said feed zone material may become small in order of said image support, said toner conveyance member, and said feed zone

material. Moreover, the summary of invention of this invention according to claim 3 consists in the process cartridge according to claim 1 or 2 characterized by having the toner convection-current means which approached in parallel with said feed zone material. Moreover, the summary of invention of this invention according to claim 4 Where toner supply is made into the gravity direction, the toner stored in said toner hopper Said feed zone material side is supplied from a toner supply aperture, and it considers as a configuration with which said toner supply aperture is plugged up in contact with said feed zone material, and consists in the process cartridge according to claim 3 characterized by considering as the configuration to which a toner is newly supplied by rotating said feed zone material. Moreover, the summary of invention of this invention according to claim 5 It is image formation equipment with which the imprint side of the middle imprint object imprinted on an imprint object after carrying out imprint maintenance of the toner image formed in the photo conductor which plurality rotates in piles is arranged by inclining with a base at an angle of predetermined. The developing roller which carries out conveyance development of the toner when the process cartridge which develops the electrostatic latent image on said photo conductor rotates in the predetermined direction in the condition of having ****(ed) to said photo conductor formed by the exposure means, By rotating in the predetermined direction in the condition of having ****(ed) with said developing roller It is based on an parallel field. the supply roller which supplies a toner to said developing roller -- having -- a laser beam scan layer -- receiving -- abbreviation -- Said photo conductor, said developing roller, and said supply roller of said process cartridge consist in the image formation equipment characterized by having two or more process cartridges currently arranged in this sequence. Moreover, the summary of invention of this invention according to claim 6 Said process cartridge A toner hopper, said supply roller, Said developing roller and said photo conductor are arranged together with the abbreviation gravity direction. And it consists in the image formation equipment according to claim 5 characterized by being constituted so that the outer diameter of said photo conductor of said process cartridge, the outer diameter of said developing roller, and the outer diameter of said supply roller may become small in order of said photo conductor, said developing roller, and said supply roller. Moreover, the summary of invention of this invention according to claim 7 consists in the image formation equipment according to claim 5 or 6 characterized by said process cartridge having the toner convection-current means which approached in parallel with said supply roller. Moreover, the summary of invention of this invention according to claim 8 Where toner supply is made into the gravity direction, said process cartridge The toner stored in said toner hopper is supplied to said supply roller side from a toner supply aperture. It consists in the image formation equipment according to claim 7 characterized by considering as a configuration with which said toner supply aperture is plugged up in contact with said supply roller, and considering as the configuration to which a toner is newly supplied by rotating said supply roller. Moreover, the summary of invention of this invention according to claim 9 Said two or more process cartridges and said exposure means which can emit two or more laser beams, Said middle imprint object which constitutes a color picture for the toner image which said process cartridge developed in piles one by one with primary imprint means, It consists in the image formation equipment according to claim 8 characterized by having secondary imprint means for imprinting said color picture in a form, a fixing means to carry out heat fixing of the toner on a form, and a means to convey a form. moreover -- at the same time the summary of invention of this invention according to claim 10 arranges said middle imprint object so that it may touch, after the imprint side of said middle imprint object has inclined at an angle of the base of said photo conductor, and predetermined -- said laser beam scan layer -- receiving -- abbreviation -- it consists in the image formation equipment according to claim 9 characterized by arranging said photo conductor, said developing roller, and said supply roller on the basis of an parallel field. moreover, said laser beam scan layer by which the summary of invention of this invention according to claim 11 is acquired for said photo conductor, said developing roller, and said supply roller from said exposure means -- receiving -- abbreviation -- criteria [field / parallel] -- carrying out -- said primary imprint means From a side to said supply roller -> aforementioned developing roller -> it consists in the image formation equipment according to claim 10 characterized by being arranged in the condition of having ****(ed) mutually together with the order of said photo conductor of said process cartridge. Moreover, the summary of invention of this invention according to claim 12 The toner stored in said

exchangeable toner hopper The toner layer which the stratification is carried out on said developing roller, and is formed on said developing roller with said supply roller After a toner is electrified by toner specification-part material, it considers as the thin layer of uniform thickness. It is carried to the development nip which touches said photo conductor, and said photo conductor is electrified in the front face with an electrification roller. The toner image which the electrostatic latent image was formed by said exposure means, and the toner developed the electrostatic latent image concerned in development nip, and was formed on said photo conductor Said primary imprint means progress and it consists in the image formation equipment according to claim 11 characterized by said middle imprint object imprinting from said photo conductor with the imprint bias potential impressed by said primary imprint means.

[0006]

[Embodiment of the Invention] This invention does so the description hung up over below. the image-formation equipment currently first arrange by the imprint side of a middle imprint means imprint on an imprint object after the 1st description carry out imprint maintenance of the toner image formed in the image support means which plurality rotate in piles inclining with a base at an angle of predetermined -- it be -- a laser beam scan layer -- receiving -- abbreviation -- it be in the point that the image support , the toner conveyance member , and the feed zone material of a development means be arrange on the basis of an parallel field .

[0007] Moreover, the 2nd description is arranged almost together with a toner hopper, feed zone material, a toner conveyance member, and image support in the gravity direction (space perpendicular lower part), and the outer diameter of the image support of a development means, a toner conveyance member, and feed zone material is a point which is small in order of image support, a toner conveyance member, and feed zone material.

[0008] And the 3rd description is the point of having the toner convection-current means which approached in parallel with feed zone material. Hereafter, the gestalt of operation of this invention is explained to a detail based on a drawing.

[0009] Drawing 1 is a block diagram explaining the gestalt of 1 operation of the process cartridge (development means 10) concerning this invention. In drawing 1 a development means (process cartridge) and 11 10 Image support (photo conductor), A toner conveyance member (developing roller) and 13 12 Feed zone material (supply roller), 14 a toner hopper base and 15 for a toner hopper and 14A A cleaning member (cleaning blade), 16 toner specification-part material and 18 for an electrification member (electrification roller) and 17 A cartridge case, In 19, the toner convection-current direction and 20 show a middle imprint means (middle imprint object), and, as for a toner convection-current means (toner convection-current wing) and 19A, 30 shows the laser beam scan layer, as for primary imprint means (imprint nip) and 40A.

[0010] When drawing 1 is referred to, the process cartridge (development means 10) of the gestalt of this operation The image support 11 (it explains hereafter, using a photo conductor as a typical example), The toner conveyance member 12 (it explains hereafter, using a developing roller as a typical example), The feed zone material 13 (it explains hereafter, using a supply roller as a typical example), It is constituted focusing on the toner hopper 14, the cleaning member 15 (it explains hereafter, using a cleaning blade as a typical example), the electrification member 16 (it explains hereafter, using an electrification roller as a typical example), and the toner specification-part material 17.

[0011] As shown in drawing 1 , together with the gravity direction (space perpendicular lower part), it is mostly arranged in order of the toner hopper 14, the supply roller (feed zone material 13), the developing roller (toner conveyance member 12), and the photo conductor (image support 11).

[0012] Moreover, the outer diameter of a photo conductor (image support 11), the outer diameter of a developing roller (toner conveyance member 12), and the outer diameter of a supply roller (feed zone material 13) are large in order of the supply roller (feed zone material 13), the developing roller (toner conveyance member 12), and the photo conductor (image support 11) (namely, outer diameter of the outer-diameter < photo conductor (image support 11) of the outer-diameter < developing roller (toner conveyance member 12) of a supply roller (feed zone material 13)).

[0013] Moreover, a photo conductor (image support 11), a developing roller (toner conveyance member 12), and a supply roller (feed zone material 13) It is based on an parallel field. laser beam

scan-layer 40A obtained from the exposure means 40 (refer to drawing 3 mentioned later) -- receiving -- abbreviation -- From the imprint nip (primary imprint means 30) side, it is arranged in the condition of having ****(ed) mutually together with the order of the photo conductor (image support 11) -> developing-roller (toner conveyance member 12) -> supply roller (feed zone material 13) of a process cartridge (development means 10).

[0014] Drawing 2 is a plan for explaining the physical relationship of the supply roller (feed zone material 13), toner supply aperture 14B, and the toner convection-current wing (toner convection-current means 19) which were seen from the process cartridge (development means 10) top face (direction [of A in drawing 1], or toner hopper base 14A). In drawing 2, 14B shows the toner supply aperture.

[0015] The toner stored in the toner hopper 14 shown in drawing 1 is supplied to a supply roller (feed zone material 13) side from toner supply aperture 14B, as shown in drawing 2.

[0016] In the process cartridge of the conventional horizontal array, even if an image color becomes thin, the toner remains in the process cartridge in practice, and there is a phenomenon in which image concentration is recovered, by taking out and shaking a process cartridge.

[0017] So, with the gestalt of this operation, it is considering as the structure which makes toner supply the gravity direction (space perpendicular lower part). This becomes possible to reduce the amount of survival in the toner hopper 14 as much as possible, and the effectiveness that the unnecessary time and effort of shaking a process cartridge (development means 10) can be saved now is done so.

[0018] Moreover, as shown in drawing 2, toner supply aperture 14B has composition which is closed in contact with a supply roller (feed zone material 13), and when a supply roller (feed zone material 13) rotates, it has the composition that a toner is newly supplied. This is enabled to prevent a toner serving as oversupply, the moderate amount of churning toners can be supplied to the toner specification-part material 17, and the effectiveness that electrification by the toner specification-part material 17 can be stabilized now is done so.

[0019] Moreover, in the process cartridge (development means 10) of the conventional horizontal array, an agitator style does not arrive to a lower layer in many cases, and toner condensation (blocking) etc. is caused in many cases.

[0020] On the other hand, while using sequence of the magnitude of an outer diameter as a supply roller (feed zone material 13), a developing roller (toner conveyance member 12), and a photo conductor (image support 11) and enlarging it in order in the gravity direction (space perpendicular lower part) with the gestalt of this operation It is considering as the configuration made [rotation of a supply roller (feed zone material 13)] to carry out the circulation convection current to toner convection-current direction 19A with a toner by the toner convection-current wing (toner convection-current means 19). While churning circulation can be carried out efficiently by this, without making a toner block, toner supply to a developing roller (toner conveyance member 12) can be smoothly carried out to homogeneity. consequently, the toner image formation to the electrostatic latent image to a photo conductor (image support 11) top -- nonuniformity -- there is nothing -- homogeneity -- and it can do with high definition and the effectiveness that high definition can be further maintained now over a long period of time is done so.

[0021] the image formation equipment 100 of the gestalt of this operation mentioned later -- laser beam scan-layer 40A -- receiving -- abbreviation -- it comes to be able to make a process cartridge (development means 10) thin by arranging the photo conductor (image support 11), developing roller (toner conveyance member 12), and supply roller (feed zone material 13) of a process cartridge (development means 10) on the basis of an parallel field Consequently, thickness of a process cartridge (development means 10) can be mostly made into the same size with the outer-diameter size of a photo conductor (image support 11), and the effectiveness that small image formation equipment 100 can be realized now is done so.

[0022] Drawing 3 is the block diagram showing 1 operation gestalt of the image formation equipment 100 concerning the gestalt of 1 operation of this invention. In drawing 3, in 40, a fixing means and 70 show an imprint object and, as for an exposure means and 50, 100 shows image formation equipment, as for secondary imprint means and 60.

[0023] When drawing 3 is referred to, image formation equipment 100 Two or more process

cartridges (development means 10), The exposure means 40 which can emit two or more laser beams, and the middle imprint object (middle imprint means 20) which constitutes a color picture for the toner image which the process cartridge (development means 10) developed in piles one by one with primary imprint means 30, It is constituted focusing on secondary imprint means 50 for imprinting in a form (recording papers, such as PPC), a fixing means 60 to carry out heat fixing of the toner on a form (recording papers, such as PPC), and a means to convey a form (recording papers, such as PPC).

[0024] So that it may touch further with image formation equipment 100, after the imprint side of a middle imprint object (middle imprint means 20) has inclined at an angle of the base of a photo conductor (image support 11), and predetermined It is based on an parallel field. at the same time it arranges the middle imprint object (middle imprint means 20) concerned -- laser beam scan-layer 40A -- receiving -- abbreviation -- By arranging a photo conductor (image support 11), a developing roller (toner conveyance member 12), and a supply roller (feed zone material 13), and making thin thickness of a process cartridge (development means 10) horizontally (space longitudinal direction) The area of base of image formation equipment 100 is made small, and it miniaturizes.

[0025] Thus, by making thickness of a process cartridge (development means 10) thin horizontally (space longitudinal direction), distance between imprint nips (primary imprint means 30) for each colors (yellow, cyanogen, a Magenta, black) can be shortened now, consequently the printing (or printing) time amount to the form (recording papers, such as PPC) of a color picture can be shortened now. Moreover, by shortening a belt, distortion and blurring of a belt can be made small now, consequently high definition-ization is attained.

[0026] Moreover, a photo conductor (image support 11), a developing roller (toner conveyance member 12), and a supply roller (feed zone material 13) It is based on an parallel field. laser beam scan-layer 40A obtained from the exposure means 40 -- receiving -- abbreviation -- From the imprint nip (primary imprint means 30) side, it is arranged in the condition of having ****(ed) mutually together with the order of the photo conductor (image support 11) -> developing-roller (toner conveyance member 12) -> supply roller (feed zone material 13) of a process cartridge (development means 10).

[0027] moreover -- the image formation equipment 100 of the gestalt of this operation -- laser beam scan-layer 40A -- receiving -- abbreviation -- it comes to be able to make a process cartridge (development means 10) thin by arranging the photo conductor (image support 11), developing roller (toner conveyance member 12), and supply roller (feed zone material 13) of a process cartridge (development means 10) on the basis of an parallel field Consequently, thickness of a process cartridge (development means 10) can be mostly made into the same size with the outer-diameter size of a photo conductor (image support 11), and the effectiveness that small image formation equipment 100 can be realized now is done so.

[0028] Next, actuation of image formation equipment 100 is explained.

[0029] Reference of drawing 1 thru/or drawing 3 carries out the stratification of the toner stored in the exchangeable toner hopper 14 on a developing roller (toner conveyance member 12) with a supply roller (feed zone material 13) with the gestalt of this operation.

[0030] The toner layer formed on a developing roller (toner conveyance member 12) is made into the thin layer of uniform thickness after a toner is electrified by the toner specification-part material 17, and it is carried to the development nip (un-illustrating) which touches a photo conductor (image support 11).

[0031] A photo conductor (image support 11) is electrified in the front face with an electrification roller (electrification member 16), and an electrostatic latent image is formed by the exposure means 40. In development nip (un-illustrating), a toner develops the electrostatic latent image concerned.

[0032] The toner image formed on the photo conductor (image support 11) is carried by imprint nip (primary imprint means 30), and is imprinted by the middle imprint object (middle imprint means 20) from a photo conductor (image support 11) with the imprint bias potential impressed by primary imprint means 30.

[0033] Moreover, the toner convection-current wing (toner convection-current means 19) is arranged in parallel with the supply roller (feed zone material 13) of the cartridge case 18. The circulation convection current of the toner will be carried out with rotation of a supply roller (feed zone material

13) by this to toner convection-current direction 19A.

[0034] As explained above, according to the gestalt of this operation, the effectiveness hung up over below is done so. The 1st effectiveness is being able to use it, without leaving a toner in the toner hopper 14 by dropping a toner in the gravity direction (space perpendicular lower part) first.

[0035] Moreover, the 2nd effectiveness goes the sequence of the magnitude of an outer diameter caudad from the upper part. A supply roller (feed zone material 13), a developing roller (toner conveyance member 12), It considers as a photo conductor (image support 11), and enlarges in order in the gravity direction (space perpendicular lower part) (). that is, it considers as the outer diameter of the outer-diameter < photo conductor (image support 11) of the outer-diameter < developing roller (toner conveyance member 12) of a supply roller (feed zone material 13) -- by things Without making a toner block, churning circulation is carried out efficiently and it is smooth and being able to supply homogeneity in a developing roller (toner conveyance member 12). Consequently, toner image formation to the electrostatic latent image to a photo conductor (image support 11) top comes be made to homogeneity and a high definition.

[0036] moreover, the 3rd effectiveness -- laser beam scan-layer 40A -- receiving -- abbreviation -- it is being able to make a process cartridge (development means 10) thin by arranging the photo conductor (image support 11), developing roller (toner conveyance member 12), and supply roller (feed zone material 13) of a process cartridge (development means 10) on the basis of an parallel field. Consequently, thickness of a process cartridge (development means 10) can be mostly made into the same size with the outer-diameter size of a photo conductor (image support 11), and small image formation equipment 100 can be realized now.

[0037] And the 4th effectiveness so that it may touch, after the imprint side of a middle imprint object (middle imprint means 20) has inclined at an angle of the base of a photo conductor (image support 11), and predetermined It is based on an parallel field. at the same time it arranges the middle imprint object (middle imprint means 20) concerned -- laser beam scan-layer 40A -- receiving -- abbreviation -- It is making an area of base small and being able to miniaturize by arranging a photo conductor (image support 11), a developing roller (toner conveyance member 12), and a supply roller (feed zone material 13), and making thin thickness of a process cartridge (development means 10) horizontally (space longitudinal direction).

[0038] In addition, it is clear that this invention is not limited to the gestalt of each above-mentioned implementation, but the gestalt of each above-mentioned implementation may be suitably changed within the limits of the technical thought of this invention. Moreover, the number of the above-mentioned configuration members, a location, a configuration, etc. are not limited to the gestalt of each above-mentioned implementation, but when carrying out this invention, they can be made into a suitable number, a location, a configuration, etc. Moreover, in each drawing, the same sign is given to the same component.

[0039]

[Effect of the Invention] Since this invention is constituted as mentioned above, the effectiveness hung up over below is done so. The 1st effectiveness is being able to use it, without leaving a toner in a toner hopper by dropping a toner in the gravity direction (space perpendicular lower part) first. Moreover, the 2nd effectiveness goes the sequence of the magnitude of an outer diameter caudad from the upper part. By what it considers as feed zone material, a toner conveyance member, and image support, and is enlarged in order in the gravity direction (space perpendicular lower part) (that is, it considers as the outer diameter of the outer-diameter < image support of the outer-diameter < toner conveyance member of feed zone material) Without making a toner block, churning circulation is carried out efficiently and it is smooth and being able to supply homogeneity in a toner conveyance member. Consequently, toner image formation to the electrostatic latent image to an image support top comes be made to homogeneity and a high definition. moreover, the 3rd effectiveness -- a laser beam scan layer -- receiving -- abbreviation -- it is being able to make a development means thin by arranging the image support, toner conveyance member, and feed zone material of a development means on the basis of an parallel field. Consequently, thickness of a development means can be mostly made into the same size with the outer-diameter size of image support, and small image formation equipment can be realized now. And the 4th effectiveness so that it may touch, after the imprint side of a middle imprint means has inclined at an angle of the base of

image support, and predetermined at the same time it arranges the middle imprint means concerned -
- a laser beam scan layer -- receiving -- abbreviation -- it is making an area of base small and being
able to miniaturize by arranging image support, a toner conveyance member, and feed zone material
on the basis of an parallel field, and making thickness of a development means thin horizontally
(space longitudinal direction).

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is a block diagram explaining the gestalt of 1 operation of the process cartridge (development means) concerning this invention.

[Drawing 2] It is a plan for explaining the physical relationship of the supply roller (feed zone material), toner supply aperture, and toner impeller which were seen from the process cartridge (development means) top face (the direction of A in drawing 1) of drawing 1 .

[Drawing 3] It is the block diagram showing 1 operation gestalt of the image formation equipment concerning the gestalt of 1 operation of this invention.

[Description of Notations]

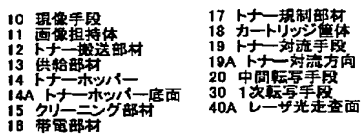
- 10 -- Development means (process cartridge)
- 11 -- Image support (photo conductor)
- 12 -- Toner conveyance member (developing roller)
- 13 -- Feed zone material (supply roller)
- 14 -- Toner hopper
- 14A -- Toner hopper base
- 14B -- Toner supply aperture
- 15 -- Cleaning member (cleaning blade)
- 16 -- Electrification member (electrification roller)
- 17 -- Toner specification-part material
- 18 -- Cartridge case
- 19 -- Toner convection-current means (toner convection-current wing)
- 19A -- The toner convection-current direction
- 20 -- Middle imprint means (middle imprint object)
- 30 -- Imprint nip (primary imprint means)
- 40 -- Exposure means
- 40A -- Laser beam scan layer
- 50 -- secondary imprint means
- 60 -- Fixing means
- 70 -- Imprint object
- 100 -- Image formation equipment

[Translation done.]

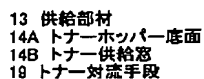
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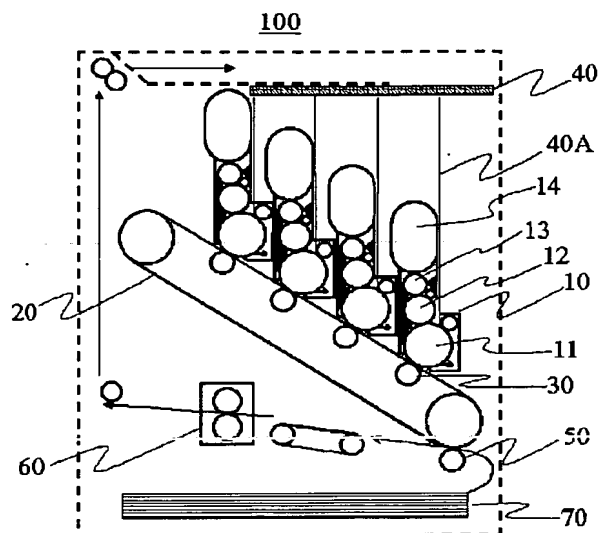
[Drawing 1]



[Drawing 2]



[Drawing 3]



- | | |
|------------|-------------|
| 10 現像手段 | 40 露光手段 |
| 11 画像担持体 | 40A レーザ光走査面 |
| 12 トナー搬送部材 | 50 2次転写手段 |
| 13 供給部材 | 60 定着手段 |
| 14 トナーホッパー | 70 転写体 |
| 20 中間転写手段 | 100 画像形成装置 |
| 30 1次転写手段 | |

[Translation done.]

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